

U.S. Department of Transportation Federal Aviation Administration

Specification Data Multiplexing Network Equipment

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3.2.1.11.2 <u>Interface adaptors</u>.

- 3.2.1.11.2.1 RS-232 to EIA-530 interface adaptors. This interface adaptor shall connect a device with EIA-530 electrical characteristics and pin configuration to a device with RS-232 C or D electrical characteristics and pin configuration. Another adaptor connects a device with RS-232 C or D electrical characteristics to a device with EIA-530 electrical characteristics. The adaptor shall be transparent to the equipment connected to it.
- 3.2.1.11.2.2 <u>V.35 to EIA-530 interface adaptors</u>. This interface adaptor shall connect a device with EIA-530 electrical characteristics and pin configuration to a device with V.35 electrical characteristics and pin configuration. Another adaptor connects a device with V.35 electrical characteristics to a device with EIA-530 electrical characteristics. The adaptor shall be transparent to the equipment connected to it.
- 3.2.1.11.3 Port sharing device (PSD). A PSD shall interface a single terminal (e.g., computer) port to multiple modems. The PSD shall be located between the terminal and multiple modem ports. Control of which modem connects to the terminal shall be by digital control signals on the PSD-modem interface. The PSD shall operate synchronously or asynchronously and be transparent to data. The PSD interfaces shall conform to RS-232 C or D or EIA-530, as applicable, to match the interfaces of the modem/terminal equipment.
- 3.2.1.11.4 Modem sharing device (MSD). An MSD shall interface a single modem port to multiple terminals. The MSD shall control which terminal is connected to the modem and the port via digital control signals on the interfaces. The MSD shall operate synchronously or asynchronously and be transparent to data. The MSD interfaces shall conform to RS-232 C or D or EIA-530, as applicable, to match the interfaces of the modem/terminal equipment.
- 3.2.1.11.5 <u>Tail circuit synchronizer</u>. A tail circuit synchronizer shall provide synchronization of two independently clocked synchronous digital ports of nominally the same data rate. The tail circuit synchronizer shall be capable of operating in a controlled or constant carrier environment. The tail circuit synchronizer interfaces shall conform to RS-232 C or D or EIA-530, as applicable, to match the interfaces of the modem/terminal equipment.
- 3.2.1.11.6 "Hot" standby switch. The "Hot" Standby Switch shall interface the digital and analog interfaces of two modems and allows for immediate 1-1 replacement of the online modem. One modem shall be on line and the other in standby mode.

Switching from on-line to standby shall be executed manually via the ANMS and "Hot" standby front panel. The "Hot" Standby Switch shall interface with eight digital interfaces per modem. Monitoring of both the on-line and standby modems shall be via the ANMS. The "Hot" standby switch interfaces shall conform to RS-232 C or D or EIA-530, as applicable, to match the interfaces of the modem/terminal equipment.

- 3.2.1.11.7 Modem substitution switch (MSS). A MSS shall connect multiple modem digital and analog interfaces in a matrix configuration. Spare modems shall be substituted for on-line modems manually via the ANMS and MSS front panel control. The MSS shall support one spare for two on-line modems (1:2); one spare for four on-line modems (1:4) and two spare modems for four on-line modems (2:4). The MSS shall interface with up to eight digital ports per modem. The MSS interfaces shall conform to RS-232 C or D or EIA-530, as applicable, to match the interfaces of the modem/terminal equipment.
- 3.2.1.11.8 Digital and analog patch panels. Both digital and analog patch panels shall be supplied. Digital patch channels shall be compatible with Dynatech EP-2 (for RS-232 or equivalent and V.35 or equivalent), EPM-1 (RS-232 monitor), and EPM-2 A module (similar to EP-2) for converting RS-232 C or D to EIA-530 and V.35 to EIA-530 shall be provided. An equivalent monitor module (similar to EPM-1) for EIA-530 shall be provided. Analog patch channels shall be compatible with Bantam connector jack field (with line, monitor, and drop) part number ADC-JC2/48M. All cables needed in conjunction with the patch panel shall be supplied. Line activity monitor plugs (compatible with Dynatech Lamp II) which provide monitoring of RS-232 signals, including receive data, transmit data, carrier detect, request-to-send and clear-to-send, shall be provided. When the line monitor is manually plugged into any digital patch channel it shall display the interface characteristics.

3.2.1.11.9 Digital A/B switch.

3.2.1.11.9.1 Performance characteristics. - The digital A/B switch shall select a primary or secondary digital path between a DTE port and two DCE ports. The digital A/B switch will normally be in the primary position. The primary and secondary paths shall operate in controlled carrier mode. Switching shall be via front panel control, remote control panel, automatically or under ANMS on/off switching option. The following pins shall be switched: All pins except pins 1 & 7 of the RS-232 interface will be switched. Strappable buffers shall be provided to allow A to B or B to A crossover. A reference clock buss shall be provided that can be driven from either an internal or external source. Pin 4 (RTS) shall be selectable to use RTS from DTE or a constant logic on. Pins 1 and 7 shall not be switched.

- 3.2.1.11.9.2 <u>Interfaces</u>. The A/B switch to DTE interface and A/B switch to DCE interfaces shall conform to RS-232 C or D. Each A/B switch shall have three DB 25 connectors; Common (Male Connector) which interfaces with the digital bridge and A & B (Female Connectors) which interfaces with the modems.
- 3.2.1.11.9.2.1 <u>Interface options</u>. Interfaces shall be convertible between RS-232 C or D and EIA-530 electrical characteristics and pin configurations. Conversion may be implemented internally or externally. For internal conversion, an SAA electronic technician shall be able to complete the conversion at the FAA location in 1 hour or less.
- 3.2.1.11.9.3 <u>Control</u>. The A/B switch shall be controlled via a switch on the front panel or remote panel. The front panel switch shall have three settings: primary position; secondary position and automatic position. The primary position shall force connect to the primary digital interface. The secondary position shall force connect to the secondary digital interface. The automatic position shall allow the A/B switch to automatically switch from the primary to the secondary path and the secondary to the primary path. The automatic position shall also permit the remote panel switch to override the automatic selection. The remote panel switch functions only when the front panel switch is in automatic.
- 3.2.1.11.9.4 <u>Automatic switching</u>. Automatic switching shall allow the data channel sufficient time to stabilize before switching back to the previous path. Stabilization time shall be at least 10 seconds.
- 3.2.1.11.9.4.1 Primary to secondary switching. The A/B switch shall automatically switch from the primary path to the secondary path based upon the state of received data carrier detect (DCD) and signal quality on the primary path. Any of the following conditions shall determine when switching occurs:
 - (a) 2 or more loss of signal occurrences of less than 3 second duration during a 10 to 60 second period.
 - (b) 2 or more loss of signal occurrences of 3 to 7 seconds duration during a 1 to 10 minute period.
 - (c) Any loss of signal greater than 7 seconds in duration.
- 3.2.1.11.9.4.2 Secondary to primary switching. The A/B switch shall monitor the channel control signal while operating on the alternate path. The A/B switch shall switch back to the primary path after channel control signal is detected and the selected switch time has elapsed. Switch time is selectable in increments of 1, 2, 5, 7 and 10 minutes. Switch time begins when the channel control signal is detected and is reset on detection of degradation of the channel control signal as noted in paragraph 3.2.1.11.9.4.1. The A/B switch shall monitor alternate

path DCD when operating on the alternate path. Failure of alternate path DCD in excess of 7 seconds shall force return to the primary path.

- 3.2.1.11.9.5 External ANMS control.
- 3.2.1.11.9.5.1 External control interface. The A/B Switch shall be controlled by the ANMS signal only when the front panel and the remote panel switches are in the automatic position. The ANMS shall signal the local and remote A/B switch to simultaneously change from primary to secondary or secondary to primary positions as required.
- 3.2.1.11.9.5.2 Reserved.
- 3.2.1.11.9.5.3 External control alarm. A continuous alarm shall be sent to the ANMS when the local and remote A/B switch is on the secondary path, or when the switch is not in the automatic mode.
- 3.2.1.11.9.6 Controls and status indicators.
- 3.2.1.11.9.6.1 <u>Controls</u>. Each A/B switch shall have the following control switches or their equivalents:
 - (a) Power On for each power supply or stand-alone unit
 - (b) Primary, Secondary or Automatic mode selection
- 3.2.1.11.9.6.2 <u>Status indicators</u>. Each A/B switch shall have the following status indicators or their equivalents:
 - (a) Power on indicator
 - (b) Primary Channel Active indicator Green LED
 - (c) Secondary Channel Active indicator Amber LED
 - (d) A/B switch not in automatic mode or in alarm Red LED
 - (e) DCD indicator Green LED with the following characteristics:
 - (1) LED on indicates A channel DCD is on,
 - (2) LED off indicates A channel DCD is off and B channel DCD is on, and
 - (3) LED flashing indicates DCD is off on both A and B channels.
- 3.2.1.11.9.6.3 Remote Panel interface. The A/B switch shall provide strappable selection for carrier detect or signal quality to the remote panel. The A/B switch shall have an externally accessible interface that functions with a remote panel up to 300 feet distant.
- 3.2.1.11.9.7 Slave operation. The A/B switch shall have an internal control to set the switch into slave operation. When in

the slave operation and automatic mode, the slave A/B switch shall follow the switching of its local A/B switch.

- 3.2.1.11.9.8 <u>Configuration</u>. The physical configuration shall include a rack mounted nest with up to 16 A/B switch cards and a stand alone unit with 1 switch card.
- 3.2.1.11.9.8.1 Rack mounted switches. The physical configuration shall be a rack-mounted (3.2.2.2) A/B switch. A minimum of 16 A/B switches shall be contained within one rack mounted enclosure not exceeding 10.5" in height. Each A/B switch shall be capable of removal or insertion from the front of the nest with power applied, causing no interaction to the other A/B switches. The enclosure will also include the dual power supplies.
- 3.2.1.11.9.8.2 Stand-alone A/B Switches. A/B switches shall also be provided with a single A/B switch and power supply in a stand alone case. These A/B switches will contain all the same features as the rack-mounted A/B switches with the exception of the remote panel interface, and dual power supply.
- 3.2.1.11.9.9 A/B switch power supply requirements. The A/B switch shall be provided with dual power supplies, powered by separate AC power feeds, as specified in paragraph 3.2.2.4. a Green LED on the front panel shall indicate that all voltages are correct. Removal of either power supply will not disrupt operation of the A/B switches.
- 3.2.1.11.9.10 Remote Panel. The remote panel will provide monitoring and control for A/B switches. Control of each A/B switch is by a "B" size panel mounted three position toggle The "B" size panel shall provide a nominal one-half inch high labeling strip. The switch positions are: select A is up, select B is down, and automatic operation is center position. The switch positions shall be labeled "A", "AUTO", and "B." toggle switches should lock in the Auto position. Two LEDs shall be located above and below the toggle switch to indicate "A" and "B" status. One LED located above the toggle switch, labelled "Active", shall light green when "A": is active, light red when the A/B switch is not in "AUTO", and be turned off when "B" is active. The other LED located above the toggle switch, labelled "DCD", shall light green when DCD is detected and light red when DCD or signal quality is not detected. One LED located below the toggle switch, labelled "ACTIVE", shall light amber when "B" is active and be turned off when "A" is active. The other LED located below the toggle switch, labelled "DCD", shall light green when DCD is detected and red when DCD is not detected. DCD indicators shall be selectable in the A/B switch as defined in paragraph 3.2.1.11.9.6.3.

- 3.2.1.12.2.4 Reserved.
- 3.2.1.12.2.5 Reserved.
- 3.2.1.12.2.5.1 Reserved.
- 3.2.1.12.2.5.2 Reserved.
- 3.2.1.13 <u>Reserved</u>.
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- 3.2.1.13.2 Reserved.
- 3.2.1.14 Reserved.
- 3.2.1.14.1 Reserved.
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- 3.2.1.15 Reserved.
- 3.2.1.16 <u>Reserved</u>.
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- 3.2.1.17.6 Reserved.
- 3.2.1.18 Reserved.

- 3.2.1.11.10 \underline{Racks} . Type III cabinet racks shall be provided for modems/multiplexers and other equipment as described in this specification.
- 3.2.1.12 <u>Reserved</u>.
- 3.2.1.12.1 Reserved.
- 3.2.1.12.2 <u>Reserved</u>.
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- 3.2.1.12.2.2 Reserved.
- 3.2.1.12.2.3 Reserved.

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- 3.2.1.19 <u>Clock box</u>. The clock box shall provide an interface between a remote radar site Common Digitizer (CD) and digital modem ports. The clock box shall also provide site identification data to each radar data channel.
- 3.2.1.19.1 Clock box CD interface. The clock box shall accept three pairs of coaxial cables with BNC type interface connectors from the CD. Each cable pair contains one cable over which radar data is transmitted from the CD and a second cable over which timing data is transmitted from the clock box to the CD. An individual cable pair, radar and clock data, is hereafter called a radar channel.
- 3.2.1.19.2 <u>Clock box modem interface</u>. This interface shall conform to the EIA RS-232 C or D standard. There shall be five interfaces per radar channel for a total of 15 connectors on each clock box.
- 3.2.1.19.2.1 Clock box modem strapping. Each digital channel output port shall have a strappable option. Each channel shall be able to connect RTS (pin 4) to either DCD (pin 8) or + 12 VDC (pin 9) on the RS-232 connector. This strap shall be set either by Berg straps or dip switches.
- 3.2.1.19.3 Internal circuitry. The internal circuitry of the clock box shall accept radar data from each CD radar channel and simultaneously provide data and clock to up to five external The clock box will monitor each radar data channel and insert the local site identification on the data line when the channel is not transmitting radar information. Circuit protection shall be provided so that any out-of-tolerance, load or voltage condition on any modem interface will not adversely affect the normal operation of any other interface. output from three channels of long range radar information shall be routed via separate output driver integrated circuits so that loss of one line driver shall not cause the loss of a single channel of radar data to all modem interfaces. The CD clock will be generated by the clock box and shall interface to pin 24 of the RS-232 ports via EIA RS-232 compatible line drivers.
- 3.2.1.19.3.1 Site Identification circuitry. Radar data from the CD will be monitored by the clock box for idle characters, indicating that radar information is not being transmitted. The identification circuitry will check for six successive idle characters. When the six idle character block is detected, the middle four idle characters will be changed to generate a 52-bit search radar test message with range and azimuth bits set to provide line and site identification. The identification message will not be transmitted more than once every six seconds, and will not modify or delete any radar message transmission from the CD.

3.2.1.19.5 External clock control.

- 3.2.1.19.5.1 Front panel control. A switch shall be provided on the front panel of the clock box in order to switch to either the primary or secondary clock. This switch shall have three settings: primary clock and disable external control, secondary clock and disable external control, and connection to the primary clock with external control enabled.
- 3.2.1.19.5.2 External control. The ANMS shall provide the capability to externally control the clock box. The ANMS shall only control the clock box when the front panel control switch is in the external control enable position.
- 3.2.1.19.6 Controls and status indicators.
- 3.2.1.19.6.1 <u>Controls</u>. Each clock box shall provide the following control switches:
 - (a) AC power on-off
 - (b) Clock select switch to select (1) primary clock and disable external control, (2) secondary clock and disable external control and (3) connect to primary clock but enable external control
- 3.2.1.19.6.2 <u>Status indicators</u>. Each clock box shall provide the following status indicators:
 - (a) Clock A indicator option Green LED
 - (b) Clock B indicator option Amber LED
 - (c) Automatic configuration Green LED turns red on alarm
- 3.2.1.19.7 <u>Configuration</u>. The physical configuration shall be a rack mounted clock box. All circuit logic will be on circuit boards easily removed from the front of the unit for service. Either clock shall be removable from service without detrimental system operation. Each radar data channel card shall be removable without detrimental system operation. Site identification and channel number shall be switch selectable or each radar data channel.
- 3.2.1.19.8 <u>Power Supplies</u>. The clock box shall be powered with dual power supplies, powered by separate AC power feeds. A green LED on the front panel shall indicate that all voltages are correct. Removal of either power supply will not disrupt operation of the clock box. Failure of either power supply shall cause an alarm.
- 3.2.1.20 Channel service unit/data service unit (CSU/DSU).
- 3.2.1.20.1 <u>Performance characteristics</u>. The CSU/DSU shall provide the DTE and network interface for connection to leased Digital Data Services (DDS). The CSU and DSU shall be available 00 one physical unit. The CSU/DSU shall not derive

3.2.1.19.4 Clock generator circuitry.

- 3.2.1.19.4.1 Clock voltage levels. The clock box shall contain two separate clock generating circuits, that provide standard RS-232 voltage outputs for driving the CD and modem interfaces. Either clock shall be removable for service without adverse system operation. Failure of either clock shall cause an alarm. Loss of DCD on either modem 1 or 2, will generate an alarm. A clock box or DCD alarm will cause a contact closure for the duration of the alarm.
- 3.2.1.19.4.2 <u>Backup clock</u>. If the primary clock fails, the secondary clock shall automatically take over. The clocks shall also be switched locally by a front panel control, or remotely by the ANMS control.
- 3.2.1.19.4.3 <u>Clock frequency</u>. The clock frequency shall be adjustable to match the standard modem signalling speeds of 2400, 4800, 7200 and 9600 bps. The clock accuracy shall meet or exceed that of the applicable modem standard.
- 3.2.1.19.4.4 <u>Clock redundancy</u>. Each channel clock shall be redundant so that there is not a single point of failure from clock generation to output.
- 3.2.1.19.4.5 <u>Clock reference</u>. Optional clock reference signals shall be selected from modem 1 channel 1 or modem 2 channel 1 to allow frequency and phase correction of the clock signals.

its power from the DDS circuit.

- 3.2.1.20.1.1 Digital interface. The digital interface shall conform to CCITT recommendation V.35 and RS-232 C or D.
- 3.2.1.20.1.1.1 Interface option. Interfaces shall be convertible between RS-232 C or D/V.35 and EIA-530 electrical characteristics and pin configurations. Conversion may be implemented internally or externally. For internal conversion, an FAA electronic technician shall be able to complete the conversion at the FAA location in 1 hour or less.
- 3.2.1.20.2 Performance standard. The CSU/DSU shall be in accordance with the requirements of AT&T Publication PUB 62310 for interfacing with sub DS-1 rate (1.544 Mbps) leased services.
- 3.2.1.20.3 Diagnostics. The CSU/DSU shall provide the following diagnostic capabilities:
 - Local and remote digital loopback to return the output of the transmitting device to its input via the local CSU/DSU interface and remote CSU/DSU interface respectively
 - Self-test to simulate actual operation of the CSU/DSU (b) and diagnose the transmitted signal
- Timing signals. The CSU/DSU shall accept timing signals from the leased digital network and external clock sources.
- 3.2.1.20.5 Data rates. The CSU/DSU shall support data rates of 2400, 4800, 9600 bps and 56/64K bps.
- 3.2.1.20.6 Controls and status indicators.
- 3.2.1.20.6.1 Controls. The CSU/DSU shall have the following control switches or their equivalents:
 - AC Power On/Off or removable power plug
 - Local and Remote digital loopback (b)
 - Self test (c)
 - The CSU/DSU shall have their configuration set from (d) the front panel.
- 3.2.1.20.6.2 Status indicators. The CSU/DSU shall have the following status indicators or their equivalent:
 - Power on indication (a)
 - Transmit Data (b)
 - (c) Receive Data

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- (d) Request-to-send
- (e) Clear-to-send
- (f) Carrier detect
- (g) Test mode to indicate the CSU/DSU is in a test mode.
- (h) Loopback indication
- 3.2.1.20.7 <u>Configuration</u>. The physical configuration shall include rack mounted (3.2.2.2) and free-standing (3.2.2.3).
- 3.2.1.20.8 ANMS interfaces. The CSU/DSU shall interface with the ANMS to allow the user to monitor the digital network and CSU/DSU for network failures, analyze problems and take restorative actions. The ANMS shall provide for local and remote digital loopback testing. The ANMS shall be in accordance with the requirements of 3.2.1.10. The ANMS shall also be compatible with the DDSII secondary channel as defined in 3.2.1.20.10.1.
- 3.2.1.20.9 <u>Test pattern generator option</u>. The test pattern generator capability shall provide line control and end-to-end testing.
- 3.2.1.20.10 Options. The CSU/DSU shall exhibit the following optional capabilities.
- 3.2.1.20.10.1 <u>DDSII secondary channel</u>. The CSU/DSU shall have a secondary supervisory channel that is compatible with DDSII and is capable of monitoring the network and performing remote diagnostics in an noninterfering mode. In the absence of DDSII service the CSU/DSU shall still be capable of interfacing with and operating over the standard DDS service provided.
- 3.2.1.21 <u>High speed time division multiplexer</u>. The High Speed Time Division Multiplexer (HSTDM) shall combine multiple data inputs into one or more aggregate (composite) outputs.
- 3.2.1.21.1 <u>Input channel parameters</u>. The HSTDM shall include port selectable synchronous input data rates including 2400, 4800, 9600, and 19.2K bps. The number of separate input ports shall be 16. Buffering shall be selectable on input channels requiring tail circuit ports to allow for synchronization between the input port external transmit clock and the HSTDM or DDS clock. The synchronous channels shall be transparent to any bit sequence or protocol.
- 3.2.1.21.2 <u>Input interface</u>. The digital input interface of the HSTDM shall conform to RS-232 C or D.
- 3.2.1.21.2.1 <u>Interface options</u>. Interfaces shall be convertible between RS-232 C or D and EIA-530 electrical characteristics and pin configurations. Conversion may be implemented internally or externally. For internal conversion,

an FAA electronic technician shall be able to complete the conversion at the FAA location in 1 hour or less.

- 3.2.1.21.2.2 <u>Carrier operation</u>. Each input EIA channel on the HSTDM shall be selectable for either constant carrier or controlled carrier operation.
- 3.2.1.21.3 Aggregate output parameters.
- 3.2.1.21.3.1 Output channel parameters. The HSTDM shall have a synchronous aggregate data rate of 56/64 Kbps.
- 3.2.1.21.3.2 <u>Output interfaces</u>. Aggregate channel interfaces shall conform to CCITT Recommendation V.35.
- 3.2.1.21.4 <u>Timing signals</u>. The HSTDM shall accept timing signals from an external source via the input channel interface or generate them via an internal clock. Each port shall be selectable between external or internal timing sources. The EIA ports shall be configurable to accommodate analog tail circuits.
- 3.2.1.21.5 <u>Diagnostics</u>. The HSTDM shall provide a local and remote digital loopback diagnostics on each channel of the HSTDM.
- 3.2.1.21.6 Controls and status indicators.
- 3.2.1.21.6.1 Controls. The HSTDMs shall have the following control switches or their equivalents:
 - (a) AC Power On/Off
 - (b) Local and remote input and aggregate channel loopback
 - (c) Internal or external timing sources
 - (d) Port configurations and speed control of EIA ports
- 3.2.1.21.6.2 <u>Status indicators</u>. The HSTDM shall have the following indicators:
 - (a) Power on indication.
 - (b) Channel activity monitor for each port.
 - (c) Loopback indicator
 - (d) Internal or external timing sources
 - (e) Speed indicator for EIA ports
- 3.2.1.21.7 <u>Configuration</u> The physical configuration shall include rack mounted (3.2.2.2) and free-standing (3.2.2.3).
- 3.2.1.22 <u>Limited distance modem (LDM)</u>. The LDM shall be available in synchronous and asynchronous modes. The LDM shall operate in a point-to-point configuration.

- 3.2.1.22.1 <u>Digital interfaces</u>. The digital interfaces shall conform to RS-232 C or D.
- 3.2.1.22.2 <u>Line interfaces.</u> The LDM shall operate on 4-wire non-loaded metallic circuits.
- 3.2.1.22.3 Speeds. The LDM shall have transmission rates of 2400, 4800, and 9600 bps.
- 3.2.1.22.4 <u>Distance</u>. The LDM shall transmit a minimum of 5 miles with a transmission rate of 9600 bps.
- 3.2.1.22.5 <u>Diagnostics</u>. The LDM shall have the following diagnostics capabilities:
 - (a) Local analog loopback to return the output of the transmitting device to its input via the local LDM analog interface.
 - (b) Reserved.
 - (c) Remote digital loopback to return the output of the transmitting device to its input via the remote LDM digital interface.
- 3.2.1.22.6 Controls and Status indicators.
- 3.2.1.22.6.1 <u>Controls</u>. The LDM shall have the following control switches:
 - (a) AC power on/off or removable plug.
 - (b) Local analog, remote analog, and remote digital loopback.
 - (c) Self test.
- 3.2.1.22.6.2 <u>Status indicators</u>. The LDM shall have the following status indicators:
 - (a) Power on indicator.
 - (b) Test mode to indicate when the LDM is in loopback or self test.
 - (c) Interface Indicators: Transmit data, receive data, data carrier detect, clear to send, request to send, data set ready.

3.2.1.22.7 <u>Mounting</u>. The mounting configuration shall include rack mounted (3.2.2.2) and free standing (3.2.2.3).

3.2.2 Physical characteristics.

- 3.2.2.1 <u>General</u>. All modems/multiplexers, ANMS equipment, HSTDMs, CSU/DSUs, LDMs, and the following ancillary equipment: interface adaptors, port sharing devices, modem sharing devices, tail circuit synchronizers, "hot" standby switches, modem substitution switches, and patch panels shall be commercial off-the-shelf equipment. Production units shall be commercially available and be installed and fully operational in a system prior to operational capability demonstration. The clock box and the digital A/B switch need not be commercial-off-the-shelf equipment.
- 3.2.2.2 Rack mounting. Racks shall be provided for mounting modems, time division multiplexers and other equipment described in this specification. The racks shall be in accordance with FAA-E-163. Modems, and other mounted equipment shall be installed in enclosures that are mountable in the racks, and all controls and indicators shall be mounted on the front panels of modem enclosures. Modems and multiplexers in their enclosures shall be independently mounted in the rack so that any modem or multiplexer in the rack may be removed and replaced without interrupting the operation of any other modem or multiplexer in the rack.
- 3.2.2.3 <u>Enclosures</u>. When the contract schedule does not specify rack mounting of modems, multiplexers or other equipment described in this specification, the contractor shall provide a free-standing enclosure, with protective feet, for each device.
- 3.2.2.4 Power supply. Free-standing modems, multiplexers and other equipment described in this specification shall employ an individual power supply. Rack-mounted equipment may employ either an individual power supply or a common power supply. Common power supplies shall consist of a main and a standby supply connected in parallel and separated by isolation Both the main and the standby power supplies shall circuity. independently satisfy the power requirements of the rack in which they are contained. All power supplies in a rack shall be independently mounted in the rack so that any power supply may be removed and replaced without interrupting the operation of the equipment contained in the rack. All power supplies in a rack shall have individual AC power circuit terminals appearing at the rack terminal strip. When a single power supply is provided with the equipment, it shall be contained within the equipment enclosure. All power supplies shall be designed for operation from a single-phase 60 Hz grounded

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three-wire AC source at 120 volts in accordance with FAA-G-2100. A single AC supply cord shall be used for each rack or free-standing equipment. Filtering and regulation shall be provided for less than 10% variation in power supply outputs over the range of service conditions specified in 3.2.5. Each rack shall be equipped with a dual 120 VAC utility outlet at the bottom rear and front of the rack. Power to these outlets shall be separate from the equipment power in the rack and fed from a separate branch circuit.

- 3.2.3 Reliability. All equipment described in this specification shall meet the following reliability requirements:
 - (1) The mean time between critical failures (MTBCF) for all specified equipment except the A/B switch and clock box shall each be no less than 20,000 hours under continuous operation.
 - (2) The MTBCF for A/B switch and clock box shall each be no less than 50,000 hours under continuous operation.
- 3.2.4 <u>Maintainability</u>. All equipment described in this specification shall meet the following maintainability requirements:
 - (1) The mean time to repair (MTTR) shall be no more than 30 minutes for all equipment except the ANMS which shall have an MTTR of 60 minutes.
- 3.2.5 Environmental conditions. All equipment shall meet the specified performance requirements in the natural and induced environments described below. Equipment shall be designed and constructed to meet the service condition requirements of FAA-G-2100 for storage and exposure in both operating and nonoperating configuration except as specified herein.
- 3.2.5.1 Ambient temperature. Equipment to be installed inside fixed facilities shall be designed and constructed to operate within specified performance at indoor operating ambient temperature up to 50 degrees C (Celsius) and down to 0 degrees C.
- 3.2.5.2 Relative humidity. The relative humidity to be used in the design and construction of the equipment shall be as specified in FAA-G-2100.
- 3.2.5.3 <u>Altitude</u>. All equipment shall be designed and constructed for non-operation storage and exposure to altitudes up to 36,000 feet MSL and for operation in altitudes up to 15,000 feet MSL without pressurization.

- 3.2.5.4 <u>Fungus</u>. All equipment shall be designed to be operated and maintained using fungus-inert materials in accordance with FAA-G-2100.
- 3.3 Design and construction.
- 3.3.1 <u>Finishes</u>. Surface finish shall be in accordance with the vendors' standard commercial practices and colors.
- 3.3.2 <u>Electromagnetic interference and susceptibility</u>. The equipment shall be designed and constructed to comply with the interference and susceptibility requirements of MIL-STD-461, parts 1 and 4 and comply with FCC Rules and Regulations, Part 15, Subpart J.
- 3.3.3 <u>Grounding</u>. All equipment shall be grounded and protected from electrical noise and transients according to the requirements of FAA-STD-020. Signal and shield grounding for all RS types of interfaces shall be installed in accordance with RS-232 C or D.
- 3.3.4 <u>Interchangeability</u>. Power supplies, modems, and modules of the same type and manufacturer provided under this contract shall be interchangeable and interoperable.
- 3.3.5 <u>Ventilation and cooling systems</u>. No forced air cooling systems shall be required for equipment described in this specification. However, equipment racks shall be capable of providing forced air cooling.
- 3.3.6 Wire and cable. All equipment wiring and cables shall be in accordance with FAA-G-2100.
- 3.4 <u>Documentation</u>. The following documents for each type of equipment described in this specification shall be provided in hard copy. All documentation shall meet the requirements of Appendix 1 of FAA-D-2494. All text shall also be provided on 5 1/4" MS DOS compatible disk media:
 - (a) General Information
 - (b) Operation
 - (c) Technical Description
 - (d) Standards and Tolerances
 - (e) Periodic Maintenance
 - (f) Maintenance Procedures

- (q) Corrective Maintenance
- (h) Parts List
- (i) Installation, Integration, and Checkout
- (j) Computer Software
- (k) Troubleshooting support data to include but not be limited to the following: (1) Complete schematic diagrams for each item in accordance with DOD-STD-100, (2) schematic diagrams shall be accompanied by a circuit description. The circuit description shall be a complete narrative description of the functions and operations of the circuit(s) depicted on the schematic diagram and (3) specific part drawings of parts in the specification.

In the event that the previously developed documentation satisfies the above requirements, said documents may be submitted to the Government for approval.

3.5 <u>Configuration management</u>. - A configuration management program shall be developed and maintained in accordance with FAA-STD-021.

TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

SECTION 3	REQUIREMENTS PARAGRAPH REFERENCE FOR DOCUMENT FAA-E-2786		VERIFICATION LEVEL AND METHOD			!
PARA. NO	TITLE		SUBSYS LEVEL	INTEG LEVEL	SITE LEVEL	REMARKS
l .	SCOPE		Х	Х	X	
2.	APPLICABLE DOCUMENTS	į	X	Х	X	i
3.	REQUIREMENTS	į				TITLE
3.1	MAJOR COMPONENT LIST	i	X	Х	х	i
3.1.1	DEFINITION	i	X	x	x	i
3.2	EQUIPMENT CHARACTERISTICS	i				TITLE
3.2.1	OPERATING CHARACTERISTICS	i	L	L	Ĺ	i
	GENERAL MODEM REQUIREMENTS	i	L	L	i L	i
3.2.1.1.1	MODEM DIGITAL INTERFACES	i	D	D	I	Í
3.2.1.1.1.1	INTERFACE OPTION	i	D	D	D	i
3.2.1.1.2	MODEM LINE INTERFACES	· i	ı	I	Ī	į
3.2.1.1.3	DIAGNOSTICS	i			-	TITLE
3.2.1.1.3.1	TYPE I MODEMS	i	D	D	D	1
3.2.1.1.3.2	TYPE II - VI MODEMS	i	D	D	D	
3.2.1.1.4	TIMING SIGNALS AND TAIL CIRCUITS	i	T	T	X	i
	CONTROLS AND STATUS INDICATORS	i				TITLE
3.2.1.1.5.1	CONTROLS	- i				TITLE
3.2.1.1.5.1.1	TYPE I MODEMS	i	D i	D	1	
3.2.1.1.5.1.2	TYPE II - VI MODEMS	i	D	D	Ī	
3.2.1.1.5.2	STATUS INDICATORS	i	Ď	D	1	
3.2.1.1.6	MOUNTING	i	ī	ī	1	
3.2.1.1.7	NETWORK MONITORING	i	D	D	D	
3.2.1.1.8	SECONDARY CHANNEL	· i	Т	T	X	
	POWER LOSS CONFIGURATION	i	Ď	D	X	
3.2.1.1.10	SOFTWARE CONFIGURABLE	i	Ď	D	D	
	TEST TONE	i	T	T	Ď	
3.2.1.1.12	MODEM COMPATIBILITY	i	À	À	X	
3.2.1.1.13	OPTIONS	i	- 1	~ 		TITLE
3.2.1.1.13.1	MANUAL DIAL BACKUP	i	D	D I	D	11166
	SEMI-AUTOMATIC DIAL BACKUP	ł	ו מ	D I	ם כ	
	AUTOMATIC DIAL BACKUP	l	D	D	D	
	MULTIPOINT OPERATION	i	D i	D I	ī	
	MASTER DEMARCATION SYSTEM INTERFACE	ľ	-			TITLE
3.2.1.1.13.5.1		!	D I	D I	D !	

TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

SECTION 3	REQUIREMENTS PARAGRAPH REFERENCE FOR DOCUMENT FAA-E-2786	<u>!</u>	FICATION LI	EVEL]
		<u>.</u>	INTEG		
PARA. NO	TITLE	LEVEL	LEVEL	LEVEL	REMARKS
3.2.1.2	TYPE I MODEMS		 		TITLE
3.2.1.2.1	PERFORMANCE CHARACTERISTICS	1			TITLE
.2.1.2.1.1	TYPE IA MODEMS	į T	т	D	l
3.2.1.2.1.2	TYPE IB MODEMS	T	т	D	1
3.2.1.2.2	TYPE I MODEM STANDARD	İ	1		TITLE
3.2.1.2.2.1	TYPE IA MODEMS	T	т	X	1
3.2.1.2.2.2	TYPE IB MODEMS	j T	Т Т	Х	1
3.2.1.2.3	ERROR CORRECTING PROTOCOL	ĺ	ĺ		TITLE
3.2.1.2.3.1	TYPE IA MODEMS	j t	Т Т	I	1
3.2.1.2.3.2	TYPE IB MODEMS	j T	Ţ	I	1
3.2.1.2.4	LINE REQUIREMENTS	į D	D	D	1
3.2.1.2.5	INPUT CHANNEL SPECIFICATIONS	D	j D	X	i
3.2.1.2.6	AUTO ANSWER/AUTO DIAL	, D	D	D	1
3.2.1.2.7	AUTOMATIC RATE ADJUST	D	D	D	1
3.2.1.2.8	TYPE IA OPTION	D	D	I	l
3.2.1.3	TYPE II MODEMS	İ	ĺ		TITLE
3.2.1.3.1	PERFORMANCE CHARACTERISTICS	jт	İτ	D	Ì
3.2.1.3.1.1	TYPE II MODEM STANDARD	į t	T	X	ĺ
3.2.1.3.1.2	ERROR RATE	į T	Т	X	ĺ
3.2.1.3.1.3	LINE REQUIREMENTS	j D	D	D	j
3.2.1.3.2	OPTIONS	į D	D	D	ĺ
3.2.1.4	TYPE III MODEMS	İ	İ		TITLE
3.2.1.4.1		į T	Ť	D	
3.2.1.4.1.1	TYPE III MODEM STANDARD	į T	Т	X]
3.2.1.4.1.2	ERROR RATE	į ī	T	X	
3.2.1.4.1.3	LINE REQUIREMENTS	į D	D	D	1
3.2.1.4.1.4	FALLBACK DATA RATE	į T	ĪΤ	X	İ
3.2.1.4.2	OPTIONS	i	İ		TITLE
3.2.1.4.2.1		j D	j D	D	ĺ
3.2.1.4.2.2	TIME DIVISION MULTIPLEXING	įτ	į T	ı	İ
3.2.1.5	TYPE IV MODEMS	i	j		TITLE
3.2.1.5.1	PERFORMANCE CHARACTERISTICS	ĪΤ	T T	D	ĺ
3.2.1.5.1.1	TYPE IV MODEM STANDARD	ј т	İΤ	х	İ
3.2.1.5.1.2	ERROR RATE	iτ	İτ	x	İ
3.2.1.5.1.3	LINE REQUIREMENTS	i	i D	D	i

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TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

SECTION 3	REQUIREMENTS PARAGRAPH REFERENCE FOR DOCUMENT FAA-E-2786		VERIFICATION LEVEL AND METHOD		
PARA. NO	TITLE	SUBSYS	INTEG	SITE LEVEL	
3.2.1.5.1.4	FALLBACK DATA RATE	įτ	Ţ	X	
3.2.1.5.2	OPTIONS	1	t	1	TITLE
3.2.1.5.2.1	TRAIN ON DATA	D	D	D	
3.2.1.5.2.2	TIME DIVISION MULTIPLEXING	T	Ţ	j ı	[
3.2.1.6	TYPE V MODEMS		1	!	TITLE
3.2.1.6.1	PERFORMANCE CHARACTERISTICS	T	Т	j D	1
3.2.1.6.1.1	TYPE V MODEM STANDARD	T	T	x	
3.2.1.6.1.2	ERROR RATE	Ţ	T	į x	
3.2.1.6.1.3	LINE REQUIREMENTS	į D	D	D	l
3.2.1.6.1.4	FALLBACK DATA RATE	jτ	İτ	įх	ĺ
3.2.1.6.1.5	FORWARD ERROR CORRECTION (FEC)	A/T	A/T	X	ĺ
3.2.1.6.2	OPTIONS	j	İ	İ	TITLE
3.2.1.6.2.1		į T	į T	į i	Ì
3.2.1.6.2.2	EYE PATTERN GENERATOR	j D	j D	į x	Í
3.2.1.7	RESERVED	i	İ	İ	TITLE
3.2.1.8	TYPE VI MODEMS	i	İ	İ	TITLE
3.2.1.8.1	PERFORMANCE CHARACTERISTICS	i ī	įτ	D	İ
3.2.1.8.1.1	RESERVED	i	i	i	TITLE
3.2.1.8.1.2	ERROR RATE	iт	iт	i x	İ
3.2.1.8.1.3	LINE REQUIREMENTS	j D	j D	j D	į
3.2.1.8.1.4		jт	įτ	į x	İ
3.2.1.8.1.5	FORWARD ERROR CORRECTION (FEC)	A/T	A/T	į x	İ
3.2.1.8.2	OPTIONS	i	i	İ	TITLE
3.2.1.8.2.1		İт	İΤ	1 1	İ
3.2.1.8.2.2	EYE PATTERN GENERATOR	i D	j D	j x	İ
3.2.1.9	RESERVED	i	i	i	TITLE
3.2.1.10	AUTOMATED NETWORK MANAGEMENT SYSTEM (ANMS)	i o	D	j D	İ
3.2.1.10.1	PERFORMANCE CHARACTERISTICS	i D	D	D	İ
3.2.1.10.1.1		ī	T	D	i
3.2.1.10.1.2	RESPONSE TIME	T	T	i D	i
3.2.1.10.1.3		D	D	D	i
3.2.1.10.2	MONITORING ANMS CONTROL	i	i	i	TITLE
3.2.1.10.2.1		i D	i D	D	į
3.2.1.10.2.1		l D	D	D	i
3.2.1.10.3	TRANSMISSION LINE EVALUATION	i D	i D	i D	i

TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

SECTION 3 REQUIREMENTS PARAGRAPH REFERENCE FOR DOCUMENT FAA-E-2786			VERIFICATION LEVEL AND METHOD			
PARA. NO	TITLE	SUBSYS	INTEG LEVEL	:	REMARKS	
3.2.1.10.4	PARAMETER CHANGES	D	D	Į D	1	
3.2.1.10.5	USER-FRIENDLY OPERATION	l D	l D	I		
3.2.1.10.6	VF LINE IMPAIRMENT MONITORING	Т	T	D	!	
3.2.1.10.7	MODEM MONITORING	D	l D	l D	•	
3.2.1.10.8	EIA INTERFACE MONITORING	D	D	D	!	
3.2.1.10.9	EXCEPTIONS	D	D	D	ļ	
3.2.1.10.10	DIAGNOSTIC TESTS	D	D	l D	!	
3.2.1.10.11	AUDIBLE ALARM	D	D	D	ļ	
3.2.1.10.12	ANMS CAPACITY	A/T	A/T	I	!	
3.2.1.10.13	MODEM CONFIGURATION CHANGE	D	D	D		
3.2.1.10.14	MODEM TEST TONE INITIATION	· T	ļτ	D	· l	
3.2.1.10.15	DIAL BACKUP	D	D	D	ļ	
3.2.1.10.16	MEMORY	D	D	D		
3.2.1.10.17	HARD DISK	D	D	D	ļ	
3.2.1.11	ANCILLARY EQUIPMENT SUPPLIED BY THE CONTRACTOR			ļ	TITLE	
3.2.1.11.1	CABLES	I	I	· I	ļ	
3.2.1.11.2	INTERFACE ADAPTORS	1	1		TITLE	
	RS-232 TO EIA-530 INTERFACE ADAPTORS	T	T	I	1	
	V.35 TO EIA-530 INTERFACE ADAPTORS	T	T	į i	1	
3.2.1.11.3	PORT SHARING DEVICE (PSD)	Ţ	T	I	1	
3.2.1.11.4	MODEM SHARING DEVICE (MSD)	Ţ	T	1	1	
3.2.1.11.5	TAIL CIRCUIT SYNCHRONIZER	T	T	I	1	
3.2.1.11.6	"HOT" STANDBY SWITCH	j D	D	I	1	
3.2.1.11.7	MODEM SUBSTITUTION SWITCH (MSS)	į D	D	I	1	
	DIGITAL AND ANALOG PATCH PANELS	į T	T	D		
	DIGITAL A/B SWITCH	İ	Ì	1	TITLE	
	PERFORMANCE CHARACTERISTICS	jт	T	I	1	
3.2.1.11.9.2		jт	į T	X	1	
	1 INTERFACE OPTIONS	j D	j D	j x	1	
3.2.1.11.9.3		ј т	Ţ	D	1	
	AUTOMATIC SWITCHING	i	İ	1	TITLE	
	1 PRIMARY TO SECONDARY SWITCHING	j T	jī	j D		
	2 SECONDARY TO PRIMARY SWITCHING	įτ	į T	į D	1	
	EXTERNAL ANMS CONTROL	i	İ	İ	TITLE	
	1 EXTERNAL CONTROL INTERFACE	i p	i D	i D	1	

TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

SECTION 3 REQUIREMENTS PARAGRAPH REFERENCE VERIFICATION LEVEL AND METHOD FOR DOCUMENT FAA-E-2786 SUBSYS | INTEG | SITE PARA. NO TITLE | LEVEL | LEVEL | LEVEL | REMARKS 3.2.1.11.9.5.2 RESERVED TITLE 3.2.1.11.9.5.3 EXTERNAL CONTROL ALARM 3.2.1.11.9.6 CONTROLS AND STATUS INDICATORS TITLE 3.2.1.11.9.6.1 CONTROLS D D t 3.2.1.11.9.6.2 STATUS INDICATORS D D D 3.2.1.11.9.6.3 REMOTE PANEL INTERFACE D D D 3.2.1.11.9.7 SLAVE OPERATION D D X 3.2.1.11.9.8 CONFIGURATION D D X X 3.2.1.11.9.8.1 RACK MOUNTED SWITCHES D 3.2.1.11.9.8.2 STAND-ALONE A/B SWITCHES D D X 3.2.1.11.9.9 A/B SWITCH POWER SUPPLY REQUIREMENTS D D X 3.2.1.11.9.10 REMOTE PANEL X D D 3.2.1.11.10 RACKS TITLE 3.2.1.12 RESERVED TITLE 3.2.1.12.1 RESERVED TITLE 3.2.1.12.2 RESERVED TITLE 3.2.1.12.2.1 RESERVED TITLE 3.2.1.12.2.1.1 RESERVED TITLE 3.2.1.12.2.2 RESERVED TITLE 3.2.1.12.2.3 RESERVED TITLE 3.2.1.12.2.4 RESERVED 3.2.1.12.2.5 RESERVED TITLE TITLE 3.2.1.12.2.5.1 RESERVED 3.2.1.12.2.5.2 RESERVED TITLE TITLE 3.2.1.13 RESERVED TITLE 3.2.1.13.1 RESERVED TITLE 3.2.1.13.2 RESERVED TITLE 3.2.1.14 RESERVED TITLE 3.2.1.14.1 RESERVED 3.2.1.14.2 TITLE RESERVED TITLE 3.2.1.15 RESERVED TITLE 3.2.1.16 RESERVED TITLE 3.2.1.16.1 RESERVED TITLE 3.2.1.16.2 RESERVED TITLE 3.2.1.16.3 RESERVED TITLE 3.2.1.16.4 RESERVED TITLE 3.2.1.16.4.1 RESERVED

VERIFICATION METHODS: T=TEST, D=DEMONSTRATION, A=ANALYSIS, I=INSPECTION, L=VERIFIED BY LOWER LAYER RQMT X=NOT APPLICABLE

TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

SECTION 3	REQUIREMENTS PARAGRAPH REFERENCE FOR DOCUMENT FAA-E-2786		FICATION LE	VEL	
PARA. NO	TITLE	SUBSYS	INTEG LEVEL	SITE LEVEL	REMARK
					·
5.2.1.16.4.2	RESERVED	!	!		TITLE
3.2.1.17	RESERVED		!		TITLE
5.2.1.17.1	RESERVED	1	1		TITLE
3.2.1.17.2	RESERVED	<u> </u>	ļ		TITLE
3.2.1.17.3	RESERVED	ļ ļ	!		TITLE
3.2.1.17.4	RESERVED	! .	!	ļ ·	TITLE
3.2.1.17.5	RESERVED		!	! .	TITLE
3.2.1.17.6	RESERVED	ļ]	!	TITLE
3.2.1.18	RESERVED		!		TITLE
3.2.1.19	CLOCK BOX	, I			TITLE
3.2.1.19.1	CLOCK BOX-CD INTERFACE	Į T	Į T	X	ļ
3.2.1.19.2	CLOCK BOX-MODEM INTERFACE	Į. T	T	X	!
3.2.1.19.2.1	CLOCK BOX-MODEM STRAPPING	T	1 T	I	ļ
3.2.1.19.3	INTERNAL CIRCUITRY	į T	T	D	ļ
3.2.1.19.4	CLOCK GENERATOR CIRCUITRY	İ		<u> </u>	TITLE
3.2.1.19.4.1	CLOCK VOLTAGE LEVELS	ј т	T	Х	
3.2.1.19.4.2	BACKUP CLOCK	T	T	D	
3.2.1.19.4.3	CLOCK FREQUENCY	т	т	X	1
3.2.1.19.4.4	CLOCK REDUNDANCY	т	т	X	ļ
3.2.1.19.4.5	CLOCK REFERENCE	T	T	X	İ
3.2.1.19.5	EXTERNAL CLOCK CONTROL	1	1	}	TITLE
3.2.1.19.5.1	FRONT PANEL CONTROL	D	į D	I	l
3.2.1.19.5.2	EXTERNAL CONTROL	D	D	I	
3.2.1.19.6	CONTROLS AND STATUS INDICATORS	ĺ	1		TITLE
3.2.1.19.6.1	CONTROLS	D	D	I	
3.2.1.19.6.2	STATUS INDICATORS	j D	D	D	1
3.2.1.19.7	CONFIGURATION	j i	į ī	1	
3.2.1.20	CHANNEL SERVICE UNIT/DATA SERVICE UNIT (CSU/DSU)	i	İ	1	TITLE
3.2.1.20.1	PERFORMANCE CHARACTERISTICS	jт	į T	X	
3.2.1.20.1.1	DIGITAL INTERFACE	j T	į T	į i	1
	1 INTERFACE OPTION	j D	D	j x	
3.2.1.20.1.1. 3.2.1.20.2	PERFORMANCE STANDARD	i T	j T	j x	
3.2.1.20.2	DIAGNOSTICS	j D	j D	D	
	TIMING SIGNALS	ј т	į T	X	İ
3.2.1.20.4	DATA RATES	T	T	j x	İ
3.2.1.20.5 3.2.1.20.6		i '	i	i	TITLE

TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

SECTION 3	REQUIREMENTS PARAGRAPH REFERENCE FOR DOCUMENT FAA-E-2786		VERIFICATION LEVEL AND METHOD			
PARA. NO	TITLE	SUBSYS LEVEL	INTEG LEVEL	SITE	 REMARKS	
3.2.1.20.6.1	CONTROLS	D	D	1	 	
3.2.1.20.6.2	STATUS INDICATORS	j D	D	i ı	i	
3.2.1.20.7	CONFIGURATION	jı	I	1	i	
3.2.1.20.8	ANMS INTERFACES	Ţ	T	i D	i	
3.2.1.20.9	TEST PATTERN GENERATOR OPTION	ĺΤ	T	i	i	
3.2.1.20.10	OPTIONS	j		i	TITLE	
3.2.1.20.10.1	DDSII SECONDARY CHANNEL	D	D	1/0	1	
3.2.1.21	HIGH SPEED TIME DIVISION MULTIPLEXER	i	D	X	i	
3.2.1.21.1	INPUT CHANNEL PARAMETERS	i r	T	x	i	
3.2.1.21.2	INPUT INTERFACE	i b	D	ï	i	
3.2.1.21.2.1	INTERFACE OPTIONS	io	D	X	i	
3.2.1.21.2.2	CARRIER OPERATION	i b	D	î	j	
3.2.1.21.3	AGGREGATE OUTPUT PARAMETERS	i	_		TITLE	
3.2.1.21.3.1	OUTPUT CHANNEL PARAMETERS	іті	T	X		
3.2.1.21.3.2	OUTPUT INTERFACES	i A/T	A/T	Ī		
3.2.1.21.4	TIMING SIGNALS	i i	T	х	i	
3.2.1.21.5	DIAGNOSTICS	i D	D	D	i	
3.2.1.21.6	CONTROLS AND STATUS INDICATORS	i			TITLE	
3.2.1.21.6.1	CONTROLS	D	D	I	i	
3.2.1.21.6.2	STATUS INDICATORS	i D	D	Ī		
3.2.1.21.7	CONFIGURATION	iii	1	Ī		
3.2.1.22	LIMITED DISTANCE MODEM (LDM)	i i	-		TITLE	
3.2.1.22.1	DIGITAL INTERFACES	i 7 i	т	ī		
3.2.1.22.2	LINE INTERFACES	Ď	D	1		
3.2.1.22.3	SPEEDS		D	D		
3.2.1.22.4	DISTANCE	i r	T	D		
3.2.1.22.5	DIAGNOSTICS	D	D	D		
3.2.1.22.6	CONTROLS AND STATUS INDICATORS		_	-	TITLE	
3.2.1.22.6.1	CONTROLS	i o i	D	1	, ,	
3.2.1.22.6.2	STATUS INDICATORS	ו מו	D	ī		
3.2.1.22.7	MOUNTING	lii	1	ī		
3.2.2	PHYSICAL CHARACTERISTICS		·	-	TITLE	
3.2.2.1	GENERAL	i a i	1	X		
3.2.2.2	RACK MOUNTING	ï	i	1		
3.2.2.3	ENCLOSURES		i	i		

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TABLE 4.1 VERIFICATION REQUIREMENTS TRACEABILITY MATRIX

	SECTION 3	TION 3 REQUIREMENTS PARAGRAPH REFERENCE VERIFICATION LEVEL FOR DOCUMENT FAA-E-2786 AND METHOD		VEL	 	
	PARA. NO	TITLE	SUBSYS	INTEG	SITE LEVEL	REMARKS
	3.2.2.4	POWER SUPPLY	D	D	I	
i	3.2.3	RELIABILITY	т	D	X	[
i	3.2.4	MAINTAINABILITY	D	D	X	
i	3.2.5	ENVIRONMENTAL CONDITIONS	T	X	X	[
i	3.2.5.1	AMBIENT TEMPERATURE	T	X	X	ļ
i	3.2.5.2	RELATIVE HUMIDITY	т	X	Х	!
i	3.2.5.3	ALTITUDE	т	l x	l x	
i	3.2.5.4	FUNGUS	Т	X	l x	ļ
i	3.3	DESIGN AND CONSTRUCTION	ļ.			TITLE
i	3.3.1	FINISHES	l I	X	Х	!
i	3.3.2	ELECTROMAGNETIC INTERFERENCE AND SUSCEPTIBILITY	T) x	X	1
i	3.3.3	GROUND I NG	T	Į x	I	ļ
i	3.3.4	INTERCHANGEABILITY	D	x	X]
i	3.3.5	VENTILATION AND COOLING	D	X	X	ļ
i	3.3.6	WIRE AND CABLE	D	I	I]
ij	3.4	DOCUMENTATION	A	X	I	ļ
İ	3.5	CONFIGURATION MANAGEMENT	A	X	X	

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